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CORE AREA PARKING STUDY

data analysis and observations

Canada

June. 1986

CORE AREA PARKING STUDY
DATA ANALYSIS AND OBSERVATIONS

VILLAGE OF BANFF
BANFF NATIONAL PARK

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CORE AREA PARKING STUDY
DATA ANALYSIS AND OBSERVATIONS
VILLAGE OF BANFF

Submitted herewith is the analysis and observations phase of the parking studies carried out in the summer of 1985. I hope that the material presented in the report can be used to improve management of the parking system in Town and to provide guidelines for the preparation of long term strategies.

Acknowledgement is due to Ms. J. Cooper and Mr. M. Brunell of Engineering Program Services. They supervised the field work and carried out the preliminary analyses. Additional thanks are due to Mr. R. Kirby, who arranged for some of the survey staff.

After review and discussion by all appropriate interests, I am prepared to produce a companion document with specific recommendations that would deal with the management and development of the Town's parking system on a long term basis.

Respectfully submitted,

J.G. Rouse, P. Eng.
Chief, Special Projects Section

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1. INTRODUCTION

Parking is a key component of the transportation system in Banff. An adequate, convenient, appropriately priced and well managed supply of parking meets both transportation and quality-of-life objectives:

- to minimize congestion in residential areas bordering on the business district,
- to improve traffic flow and safety for both vehicles and pedestrians,
- to maintain a good business climate for the economic health of the community, and
- to present Banff as a hospitable centre for visitors to the national park.

An overview of the parking system in the central area of Banff - particularly during the summer season - would suggest that the objectives stated above are not being met in a fully successful manner.

It is common to see the residential areas along streets such as Beaver and Marten, heavily utilized by overflow parking from the business district. It is common to see vehicles on yellow curbs at corners, on crosswalks and by hydrants, with the result that safety is jeopardized and traffic flow is poor.

The aura of continual congestion in the core area suggests an atmosphere of high levels of tourist activity and economic prosperity. But this must be tempered with the realities of frustrated vistors unable to find a convenient parking spot. The image and reputation of Banff as an attractive national park visitor centre suffers when congestion levels are chronic.

The Parks Service has initiated a program to update planning for the community and will be addressing residential and commercial land use, the utility systems, community services and a variety of other dimensions to life in Banff for the residents and visitors.

A logical component of this planning program is an examination of the operation of the parking system in the core area of Town. A documentation of

the supply and use of parking spaces can be used:

- to guide decisions on current management of the parking system,
- to assess the supply of parking spaces against the demand for parking spaces, and
- to assist in designing a strategy for long term design and management of an appropriate and convenient supply of parking spaces.

It is the objective of this report to present a documentation of the parking system in the central area of Banff as it existed during the summer of 1985. As well as the statistics on the supply and use of parking spaces, observations will be offered on the operation of the parking system.

Improvements to operation of the system and strategies for long range development and management of the parking system will be developed in consultation with all vested interests using this document as a reference along with other information as appropriate.

2. FIELD STUDIES AND SURVEYS

A program to assess the operation of the core area parking system in Banff was designed during the spring of 1985. During June and early July, an inventory of all public parking spaces was carried out and surveys were designed.

A formal parking survey was carried out by a crew of Parks staff on Saturday, July 20 and some followup observations were carried out during the balance of the summer. The formal survey involved personnel walking specified routes throughout the central area of town on an hourly basis, beginning each hour from 10:00 a.m. to 9:00 p.m. When a vehicle was observed parked along the course of a route, three letters or numbers of the licence plate and the type of vehicle were recorded on a prepared inventory form.

From this type of survey procedure the following information can be obtained:

(a) the number of vehicles using the parking spaces in the study area as well as instances of improperly parked vehicles such as at yellow curbs on corners,
(b) the duration of stay of the parked vehicles,
(c) the turnover or number of vehicles using the parking spaces,
(d) the types of vehicles using the parking spaces, and
(e) the total number of vehicles using the public parking spaces.

This type of survey will not identify short-term parkers who come and go during intervals between the hourly observations. However, the number of parkers missed by this survey procedure can be satisfactorily estimated using a logarithmic probability function*. Where appropriate, data reported as a result of the survey observations have

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* Accuracy of the Periodic Parking Study.
Donald S. Cleveland, Texas Transportation Institute
TRAFFIC ENGINEERING, September 1963.

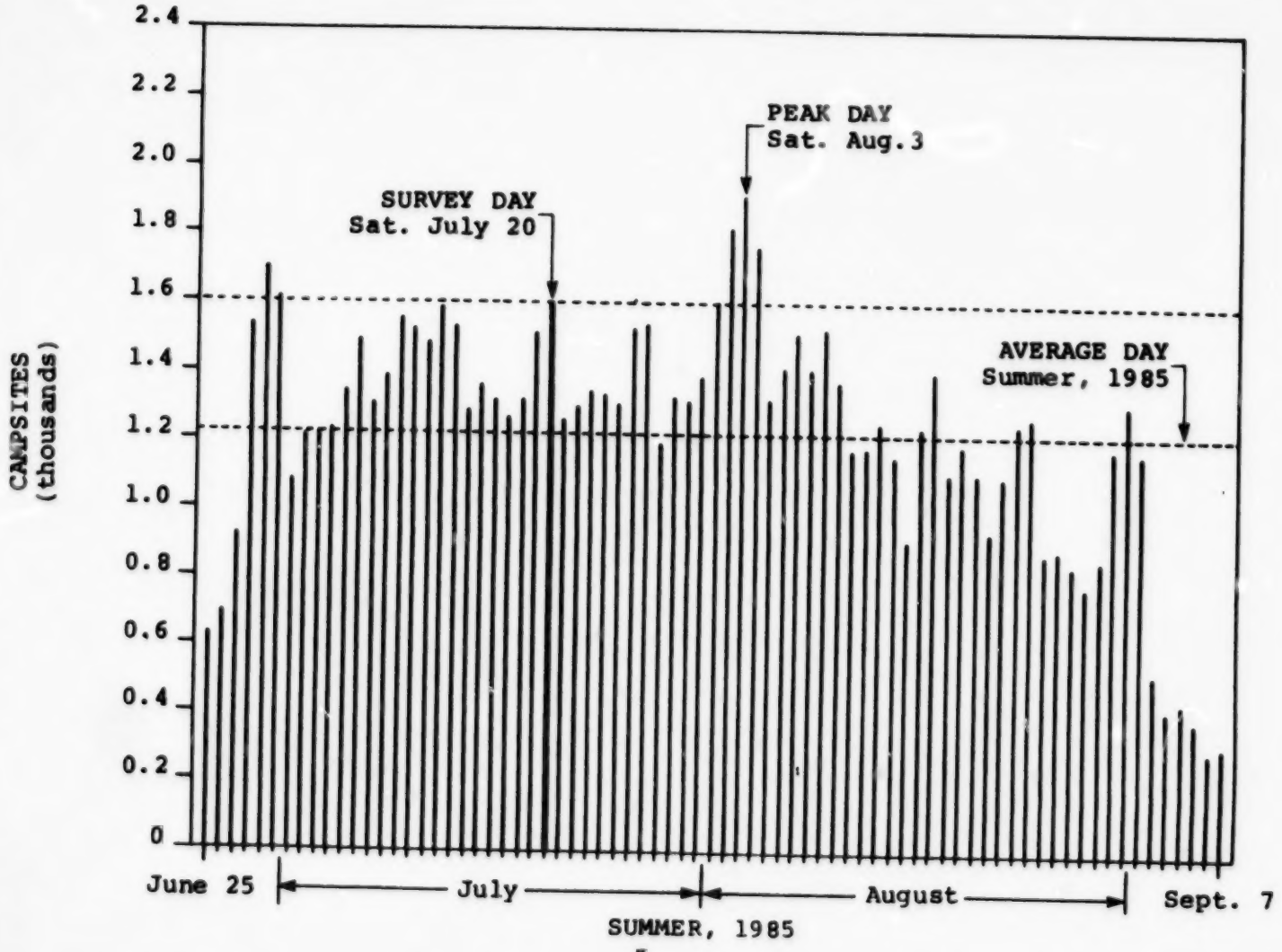
been adjusted to account for the number of short-term parkers missed during the surveys. In addition to the formal survey which covered the use of public parking spaces, observations were made on the use of lanes and parking spaces identified for private use.

The day for the formal survey - Saturday, July 20 - was chosen with care to get data on a typical, but not extremely busy summer day. It is inappropriate to measure and plan for conditions that only occur on a day or two of the year. It is also inappropriate to assess what would be called average summer conditions in Banff because the levels of activity fluctuate constantly.

To assess the survey day in context, the number of occupied campsites in the five campgrounds in the Town region were tallied for the summer season as a proxy for the levels of activity in Town. This analysis is shown in Figure 1. In Figure 1, it can be seen that during the 75 days from June 25 to September 7, there was a nightly average of 1233 occupied campsites. On the night of the survey day, there were 1601 campsites occupied; a level about 30% over the average. Activity levels exceeded those of the survey day on five occasions during the summer and there were a total of 18 days when activity levels were 90% or more of the survey day.

Thus, the conditions that prevailed during the survey day are considered a good representation of conditions to be planned for in the planning and development of the core area parking system in Banff. Another criteria specified for the survey day was that weather conditions be sunny and warm to reflect the activity patterns of people on a typical summer day. On Saturday, July 20, the skies were sunny, the winds calm and temperatures for the day were in the 20s.

FIGURE 1
ACTIVITY REFERENCE LEVELS
OCCUPIED CAMPSITES
BANFF TOWN REGION
SUMMER, 1985



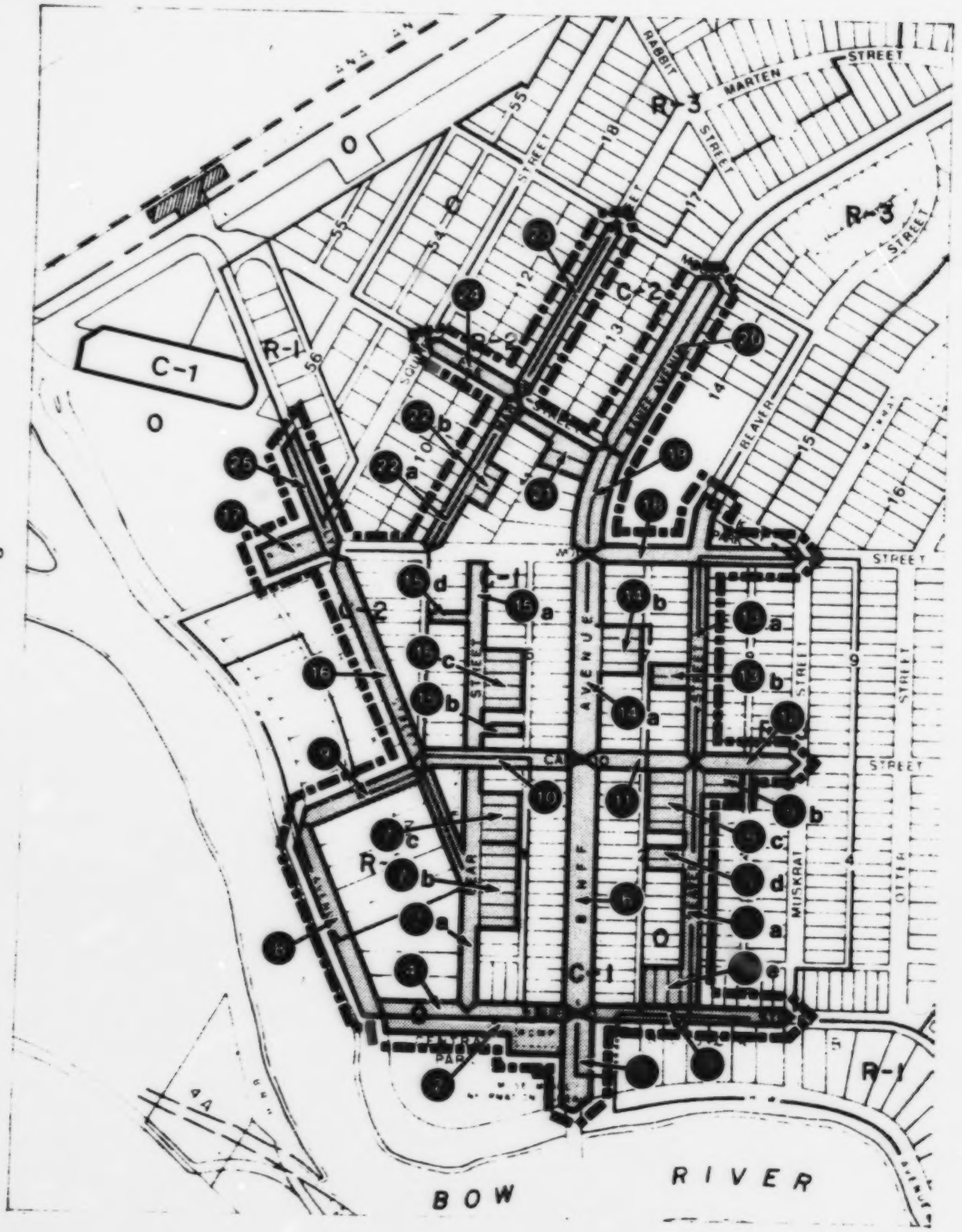
3. THE STUDY AREA

Figure 2 is a map of the central area of Banff with the parking study area highlighted. The study area was extended beyond the business district to measure the extent to which residential areas are required to meet the parking demands of the business district.

It is neither appropriate nor realistic to analyze statistics on the use of individual parking spaces. Accordingly, parking spaces demonstrating similar use characteristics have been aggregated into a series of zones for analysis purposes.

These zones are shown by number on Figure 2.

FIGURE 2
STUDY AREA AND PARKING ZONES
BANFF, SUMMER 1985



4. THE PARKING SPACE INVENTORY

Prior to carrying out the formal surveys, an inventory was compiled of the core area parking system. Included in the inventory for survey purposes were all curb and off-street spaces available to the general public.

Some off-street parking is associated with specific land uses such as the lots at the Liquor Store, the Safeway Store and behind the Cascade Hotel. However, there are no regulations or enforcement on the use of this type of parking and general purpose use is common.

Not included in the inventory are spaces at the rear of buildings, spaces on service station lots, spaces reserved for hotel guests and some private or reserved parking spaces. There are about 300 spaces of this nature in the study area that are not available to the general public. They range from a fenced lot for guests on the premises of the Mt. Royal Hotel (35 spaces) to a lot for rental car storage (13 spaces) to a variety of owner/staff spaces to spaces used to store boats, trailers and unlicenced vehicles.

Table 1 is a listing of the inventory of public parking spaces and Figure 3 is a map of the inventory. The study area contains a total of 1342 parking spaces, of which 662 (49%) are at the curb and 680 (51%) are off-street.

In the study area there is no fee or metered parking. There are a few instances of regulated or special purpose parking, as follows:

- 15 minute parking, 4 spaces in front of post office,
- no parking, both sides of Wolf from Lynx to Banff Avenue,
- no parking, north side of Wolf from Banff Avenue to Beaver,
- no parking, west side of Lynx from Wolf to Cariboo,
- bus stop, east side of Banff Avenue at Elk Street,
- police parking, north side of Cariboo near Bear,
- bus stop, taxi stand and theatre loading, west side of Banff Avenue south of Cariboo,
- police parking, bus stop, horse and buggy stand, taxi stand and hotel

loading zones, east side of Banff Avenue between Buffalo and Cariboo,
- 15 minute parking, 5 spaces on east side of Banff Avenue in front of information building,
- no parking, 5 spaces on Beaver across from Firehall,
- no parking, on Beaver in front of Firehall,
- 15 minute parking, 6 spaces on west side of Bear south of Wolf.

TABLE 1
PARKING SPACE INVENTORY
BANFF, SUMMER 1985

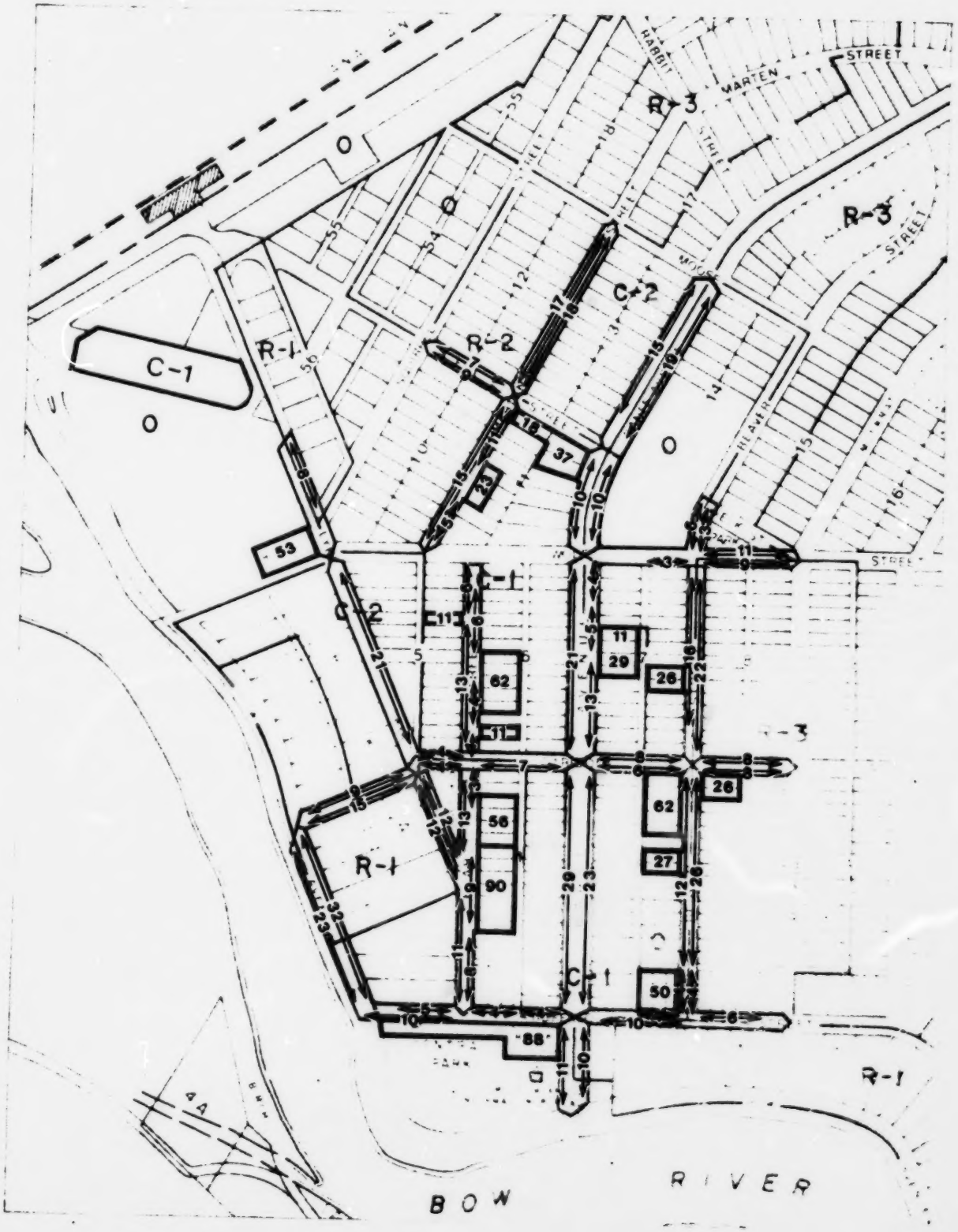
ZONE	DESCRIPTION	CURB SPACES	OFF-STREET SPACES	ZONE TOTAL
1	Banff Avenue South	21		21
2	Central Park		88	88
3	Buffalo Street East	20		20
4	Buffalo Street West	23		23
5	Beaver Street South			211
	(a) On-street	46		
	(b) Lot, S.E. Corner Beaver/Cariboo		26	
	(c) Lot, S.W. Corner Beaver/Cariboo		62	
	(d) Lot behind Cascade Hotel		27	
	(e) Lot, N.W. Corner Beaver/Buffalo		50	
6	Banff Avenue South Central	52		52
7	Bear/Lynx Streets South			214
	(a) On-street	68		
	(b) Lot Behind Hudson Bay		90	
	(c) Lot by Magpie and Stump		56	
8	Bow Avenue	55*		55
9	Cariboo Street West	24*		24
10	Cariboo Street West Central	15		15
11	Cariboo Street East Central	14		14
12	Cariboo Street East	16		16
13	Beaver Street Central			64
	(a) On-street	38		
	(b) Gravel Lot near AGT Building		26	

TABLE 1(Continued)
PARKING SPACE INVENTORY
BANFF, SUMMER 1985

ZONE	DESCRIPTION	CURB SPACES	OFF-STREET SPACES	ZONE TOTAL
14	Banff Avenue North Central			
	(a) On-street			83
	(b) Lot at Information Building	43		
15	Bear Street Central		40	
	(a) On-street			114
	(b) Lot North of Red Rooster	30		
	(c) Lot behind Sundance Mall		11	
	(d) Lot near Crag and Canyon		62	
16	Lynx Street Central		11	
17	Lot at Site of New Hospital	21		21
18	Wolf/Beaver Streets East		53*	53
19	Banff Avenue North	32		32
20	Banff Avenue North Fringe	20		20
21	Lot at Safeway Store	34		34
22	Marten Street North		55	55
	(a) On-street			54
	(b) Lot at Liquor Store	31		
23	Marten Street North Fringe		23	
24	Elk Street West	35		35
25	Lynx Street North	16		16
TOTAL		8		8
		662	680	1342

* Nominal Capacities

FIGURE 3
PARKING SPACE INVENTORY
BANFF, SUMMER 1985



5. PARKING ACCUMULATIONS

The parking survey provided data on the variations in levels of parking activity over the course of the day. The number of motor vehicles parked (accumulations) by zone and time of day are summarized for the study area in Table 2.

Figure 4a depicts graphically the study area accumulations listed in Table 2. As shown in Figure 4a, overall parking activity increases from a level where about 60% of the spaces were occupied at 10:00 a.m. to a peak of about 90% in mid-afternoon. A late afternoon dip to about 80% is followed by a mid-evening peak of about 85%.

Figure 4b depicts accumulations along Banff Avenue from Elk Street to the bridge (Zones 1,6,14a and 19). Parking activity in this sector of town is intense, ranging from a minimum of 90% of the spaces occupied at 10:00 a.m., up to 106% occupancy on a couple of occasions. During the course of the day, occupancy in these zones averaged 99%. Occupancy levels in excess of capacity are realized by vehicles parking in no parking zones, across driveways, crosswalks, et cetera.

Figure 4c details accumulations in the parking lots off Bear Street behind the Bay and beside the Magpie and Stump. As with Banff Avenue curb parking, these lots are heavily used, averaging about 92% occupancy and peaked beyond capacity at 2:00 p.m.

Figure 4d details accumulations in an assembly of fringe districts that, for the most part, are adjacent to residential land uses. Peak use of these zones was about 70% in mid-afternoon and averaged 50% over the course of the survey day. It is clear from the information in Figure 4d that the residential areas are required to absorb business area parking demands on a chronic basis.

TABLE 2
PARKING ACCUMULATIONS (Motor Vehicles)
BANFF, SUMMER 1985

ZONE	TIME											
	10	11	NOON	1	2	3	4	5	6	7	8	9
1	6	7	19	20	19	17	16	10	15	18	18	19
2	52	72	83	82	89	89	86	84	88	81	84	77
3	9	15	14	16	16	18	18	19	20	17	20	17
4	15	23	21	19	26	24	22	23	20	21	19	15
5a	23	27	33	42	43	44	41	34	38	46	43	39
5b	16	16	18	22	23	24	22	13	12	19	16	16
5c	39	59	61	65	64	65	66	68	64	68	65	64
5d	12	16	13	13	17	20	25	23	25	27	27	27
5e	19	21	29	48	44	48	43	52	51	51	49	52
6	54	55	58	57	57	65	60	57	53	56	59	64
7a	23	45	59	61	59	55	50	48	60	59	61	52
7b	61	78	91	91	95	93	90	69	80	90	90	86
7c	42	50	52	54	53	52	47	49	52	50	52	47
8	1	1	9	20	31	23	19	18	12	8	3	1
9	4	5	24	25	22	19	13	15	13	12	7	11
10	17	20	18	20	23	16	21	18	22	18	19	18
11	11	11	10	17	13	14	14	13	16	14	13	11
12	3	7	9	16	13	15	14	8	9	12	12	11
13a	13	23	13	23	24	27	27	21	27	29	28	22
13b	9	9	13	17	12	13	11	7	7	8	7	6
14a	42	44	45	38	42	38	35	44	44	45	41	42
14b	38	35	41	35	35	34	28	24	34	35	30	32

TABLE 2 (Continued)
PARKING ACCUMULATIONS (Motor Vehicles)
BANFF, SUMMER 1985

ZONE	TIME											
	10	11	NOON	1	2	3	4	5	6	7	8	9
15a	29	30	28	31	32	31	28	27	28	32	35	31
15b	1	5	9	11	10	11	9	7	10	6	8	6
15c	44	59	57	62	62	64	62	60	63	61	63	57
15d	9	11	10	11	9	10	8	7	8	8	9	9
16	17	19	17	18	22	17	15	18	20	20	19	20
17	27	32	38	47	48	39	34	36	36	42	42	41
18	4	10	15	20	21	26	21	22	13	16	24	17
19	21	18	23	21	17	21	19	17	19	15	21	21
20	6	3	10	18	10	12	9	9	12	16	11	13
21	57	50	56	58	62	63	64	62	55	48	56	33
22a	26	24	28	27	28	32	29	27	26	28	27	22
22b	4	11	9	16	15	15	22	21	17	15	14	5
23	17	15	21	17	17	19	21	21	18	19	15	14
24	7	9	12	12	11	14	14	13	11	9	8	8
25	0	0	0	0	0	0	1	8	2	7	8	1
TOTAL	778	935	1066	1170	1184	1187	1124	1072	1100	1126	1123	1027

FIGURE 4a
PARKING ACCUMULATIONS
STUDY AREA
BANFF, SUMMER 1985

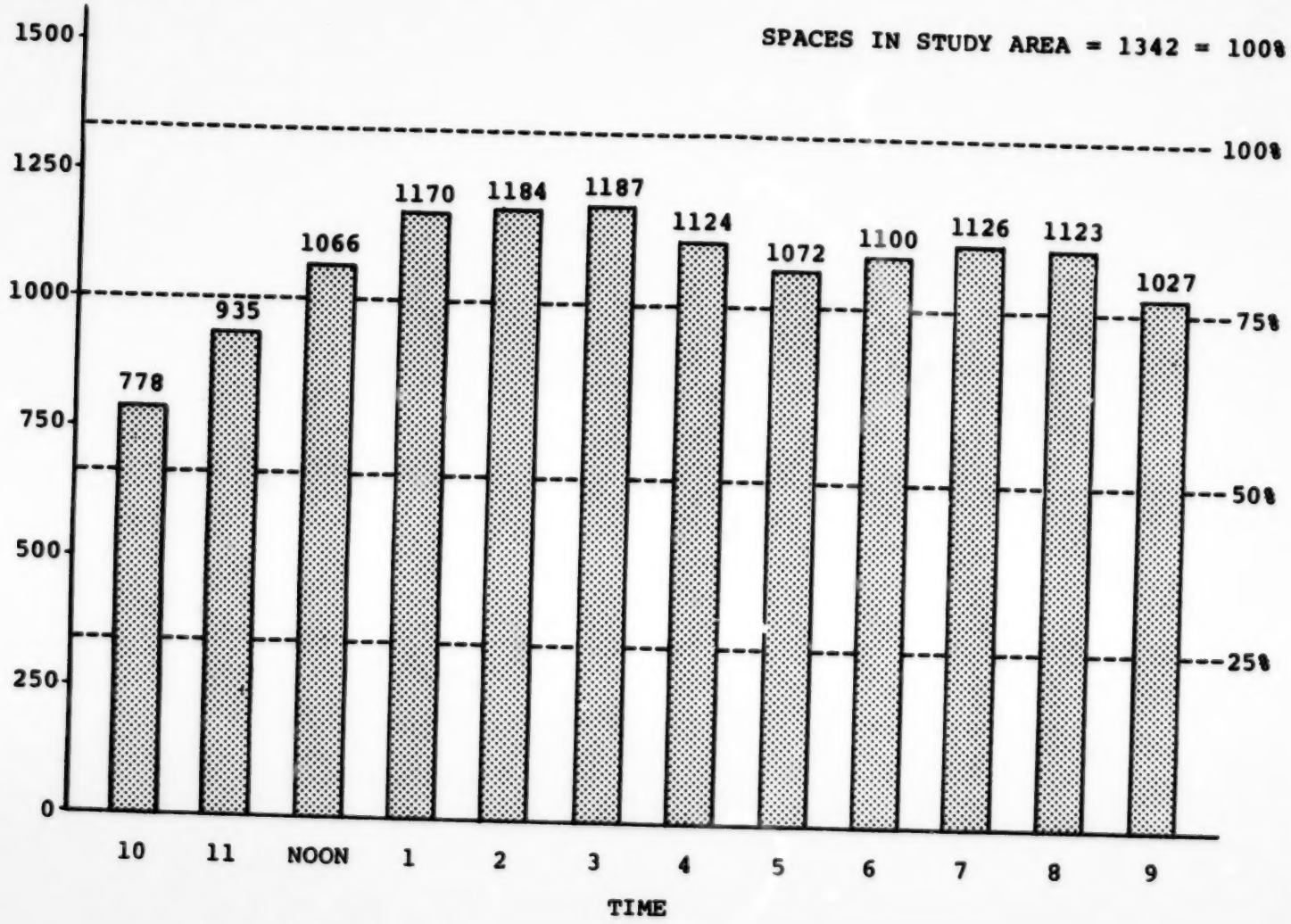


FIGURE 4b
PARKING ACCUMULATIONS
BANFF AVENUE, ELK STREET TO BRIDGE Zones 1,6,14a,20
BANFF, SUMMER 1985

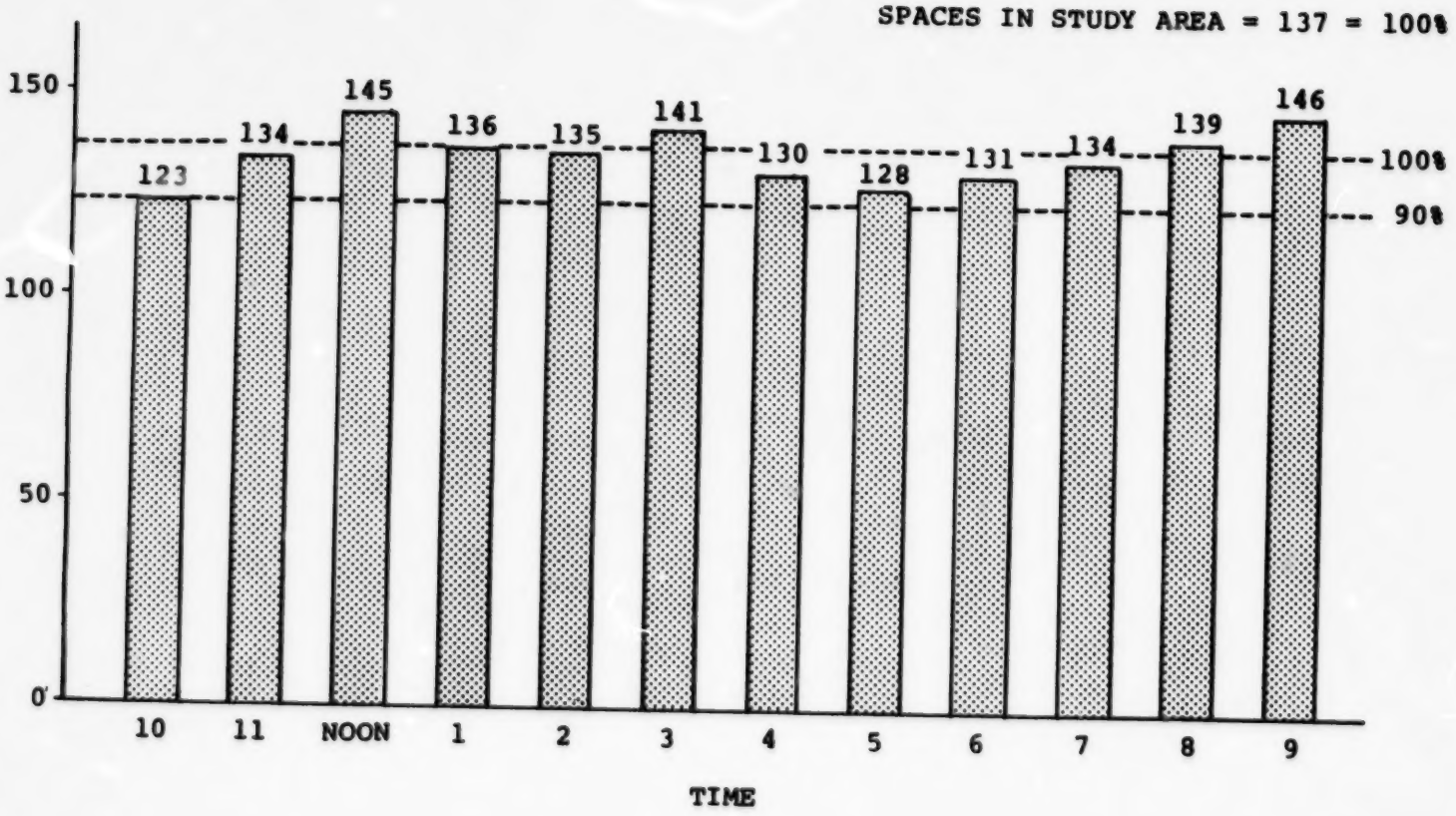


FIGURE 4c
PARKING ACCUMULATIONS
BEAR STREET LOTS BETWEEN BUFFALO AND CARIBOO ZONES 7b,7c
BANFF, SUMMER 1985

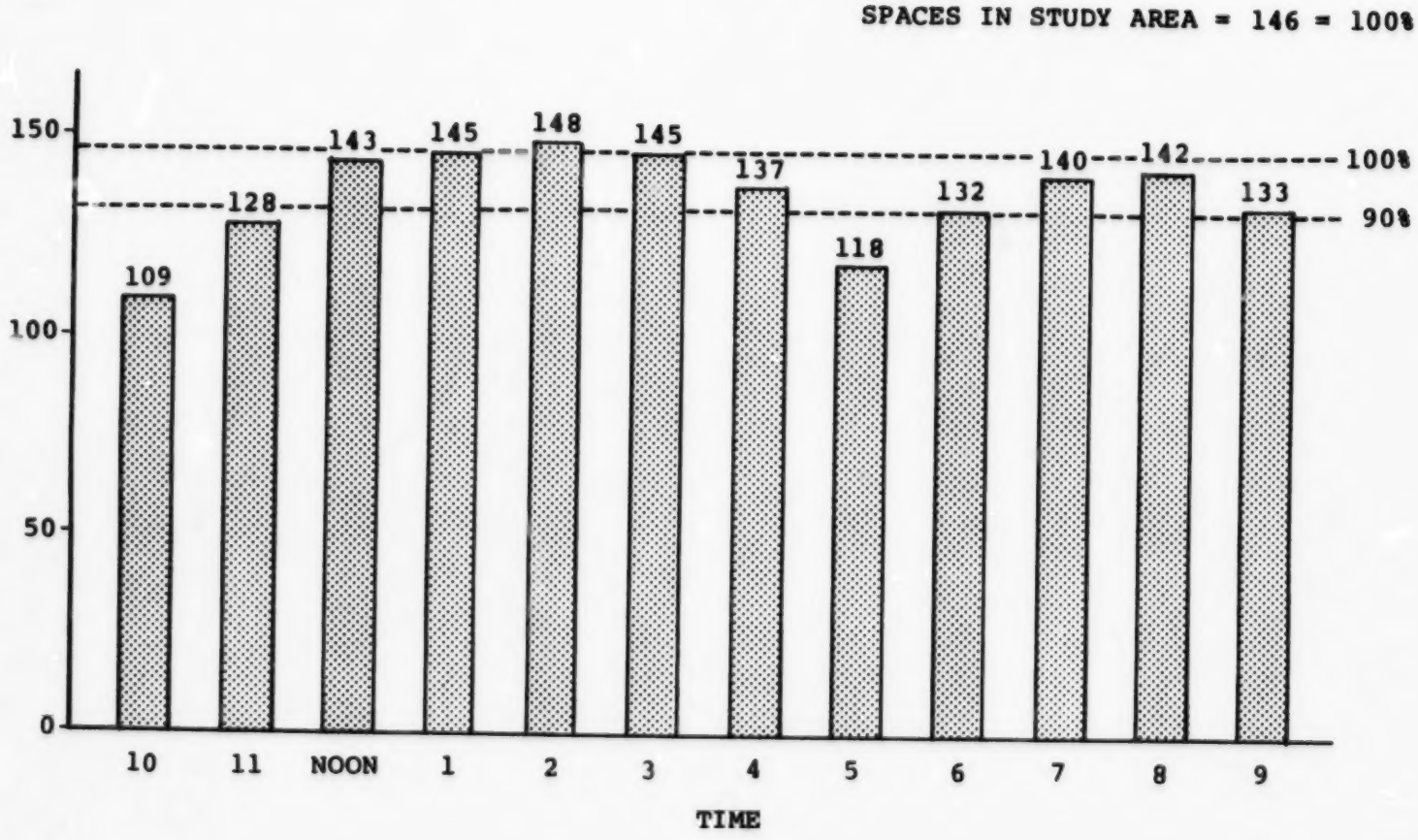
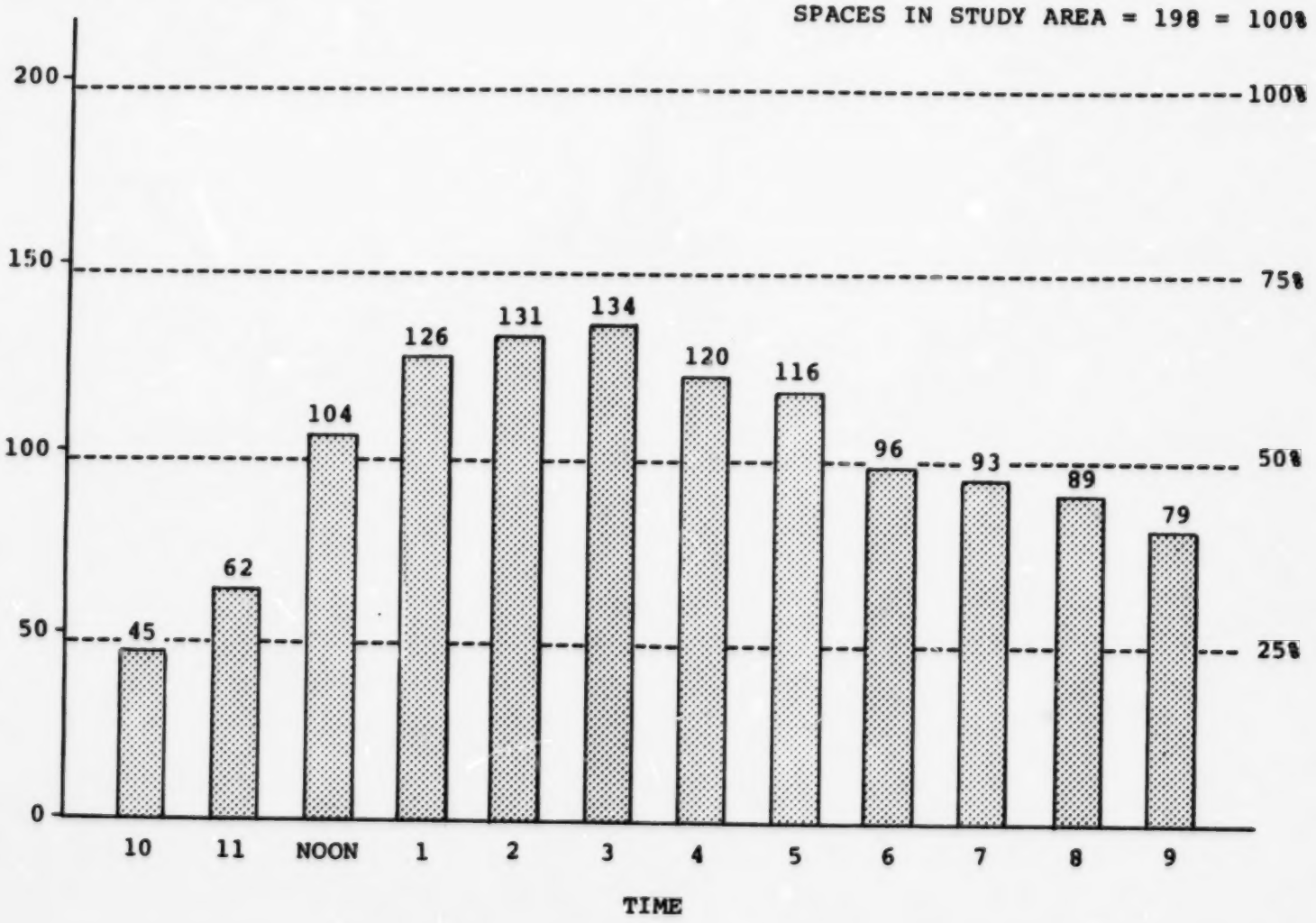


FIGURE 4d
PARKING ACCUMULATIONS
FRINGE ZONES # 3,8,9,12,18,23,24
BANFF, SUMMER 1985



6. PARKING DURATIONS

A summary of parking durations for the study area is presented in Table 3. The data in Table 3 includes calculated estimates of the number of short-term parkers not seen during the periodic surveys. During the period of the survey, it is estimated that a total of 9914 instances of parking took place in the study area.

The overall average length of time parked was 69 minutes and the median parking time was 36 minutes. Maximum averages were recorded in the lot next to the laundry on Bear Street (293 minutes) which was used primarily by all day parkers. Other durations considerably above average were observed in the lot at the southeast corner of Beaver and Cariboo, in the lot behind the Cascade Hotel, in the lot off Beaver Street near the AGT Building, in the lot at the site of the new hospital and along Marten Street north of Elk.

The shortest durations, which averaged 28 minutes (with a median of 12 minutes) took place in the lot at the Liquor Store. Another short average duration of 30 minutes (with a median of 25 minutes) took place in the lot at the Safeway Store.

Curb parking durations along Banff Avenue from the bridge to Elk Street averaged 57 minutes. Durations in the lots off Bear Street, between Buffalo and Cariboo, averaged 99 minutes, about 74% longer than the Banff Avenue curb parking.

There were 653 long term (over 3 hours) parkers, about 6.6% of the total. Nearly three-quarters (74%) of the parkers stayed less than one hour, demonstrating a very high demand for convenient, short-term parking in the central area of Banff.

TABLE 3
NUMBER OF PARKERS AND PARKING DURATIONS
BANFF, SUMMER 1985

ZONE	LENGTH OF TIME PARKED - HOURS						NUMBER OF PARKERS	AVERAGE TIME PARKED-MINUTES	MEDIAN TIME PARKED-MINUTES
	- ½	½-1	1-2	2-3	3-5	+ 5			
1	50	66	30	18	1	2	167	69	45
2	228	280	152	64	30	5	759	73	46
3	62	64	28	12	1	6	173	74	42
4	62	75	28	16	6	7	194	85	42
5a	82	93	32	20	9	13	249	84	43
5b	21	30	17	5	10	12	95	136	54
5c	115	160	76	40	29	23	443	101	45
5d	19	35	11	9	8	16	98	149	54
5e	73	108	50	17	20	23	291	112	48
6	263	263	90	29	8	5	658	55	39
7a	155	174	93	24	21	2	469	68	42
7b	144	207	106	52	27	40	576	104	48
7c	109	134	77	29	26	13	388	92	45
8	33	42	26	11	2	0	114	70	47
9	42	53	20	11	1	4	131	75	43
10	72	81	30	4	7	6	200	68	39
11	57	63	31	5	2	1	159	58	39
12	23	29	22	5	2	3	84	89	48
13a	21	20	18	4	5	4	72	102	48
13b	7	14	6	1	4	7	39	178	57

TABLE 3 (Continued)
NUMBER OF PARKERS AND PARKING DURATIONS
BANFF, SUMMER 1985

ZONE	LENGTH OF TIME PARKED - HOURS						NUMBER OF PARKERS	AVERAGE TIME PARKED-MINUTES	MEDIAN TIME PARKED-MINUTES
	- ½	½-1	1-2	2-3	3-5	+ 5			
14a	200	215	63	19	11	5	513	57	37
14b	85	107	42	19	13	9	275	80	42
15a	140	139	36	14	4	8	341	61	36
15b	21	24	11	3	3	4	66	105	37
15c	137	146	79	18	17	31	428	102	39
15d	2	5	3	2	1	9	22	293	150
16	56	66	40	7	2	5	176	75	42
17	48	69	40	17	17	18	209	131	51
18	66	74	26	12	3	3	184	63	39
19	101	95	25	6	10	3	240	56	31
20	34	41	19	5	3	2	104	72	42
21	601	432	45	4	5	6	1093	30	25
22a	95	106	31	15	10	7	264	71	37
22b	308	125	1	2	0	4	440	28	12
23	17	36	8	7	10	10	88	143	45
24	25	32	10	5	6	3	81	93	44
25	11	13	7	0	0	0	31	50	39
	3585	3716	1429	531	334	319	9914	69	36
	(36%)	(38%)	(15%)	(5%)	(3%)	(3%)	(100%)		

7. PARKING SPACE TURNOVER AND UTILIZATION

Table 4 summarizes, by zone, the average number of parkers using each space and the amount of time the parking spaces were occupied over the course of the survey. The data in Table 4 provides good overall measures of the levels of parking activity in the various zones of the study area.

For the study area as a whole, each parking space was used an average of 7.4 times. The most intense use of curb spaces was along Banff Avenue from Buffalo to Elk Street, on Cariboo Street from Lynx to Beaver and on Lynx from Cariboo to Wolf. On these streets it was typical for each space to be used by an average of 12 to 13 parkers over the course of the survey.

The most intense use of off-street parking spaces occurred on the lots at the Liquor Store and the Safeway Store. Each space in these lots was used an average of nearly 20 times over the survey day. More typical use of off-street spaces were averages in the range of 6 to 8 parkers per space.

Per cent utilization of the parking spaces in a zone is a good indicator of areas where there is stress on the supply of spaces. In areas of high turnover/short duration parking, good operation is realized when utilization rates do not exceed 90% because there should always be a few empty spaces between the departures and arrivals of parkers.

As detailed in Table 4, about one-third of the zones had utilization rates of 90% or more during the period of the survey. The highest utilization took place along Buffalo Street from Banff to Bow Avenues, on Cariboo Street from Banff Avenue to Lynx and in the lot on Beaver Street at the former site of the bus station. In each of these three zones, the very high utilization percentages were realized from improper or illegal parking. On Buffalo and Cariboo Streets the yellow curbs were occupied almost continually and on the former site of the bus station, parkers commonly spilled over from the lot into the lane behind the Mt. Royal Hotel.

TABLE 4
PARKING SPACE UTILIZATION
BANFF, SUMMER 1985

ZONE	PARKING SPACES	PARKERS 10 A.M. to 10 P.M.	AVERAGE # PARKERS PER SPACE	AVERAGE DURATION-MINUTES	SPACE HOURS - 10 A.M. - 10 P.M.		
					AVAILABLE	UTILIZED	PER CENT UTILIZED
1	21	167	8.0	69	252	192	76
2	88	759	8.6	73	1056	923	87
3	20	173	8.7	74	240	213	89
4	23	194	8.4	85	276	275	100
5a	46	249	5.4	84	552	349	63
5b	26	95	3.7	136	312	215	69
5c	62	443	7.1	101	744	746	100
5d	27	98	3.6	149	324	243	75
5e	50	291	5.8	112	600	543	91
6	52	658	12.7	55	624	603	97
7a	68	469	6.9	68	816	531	65
7b	90	576	6.4	104	1080	998	92
7c	56	388	6.9	92	672	594	89
8	55	114	2.1	70	660	133	20
9	24	131	5.5	75	288	164	57
10	15	200	13.3	68	180	227	126
11	14	159	11.4	58	168	154	91
12	16	84	5.3	89	192	125	65
13a	38	72	1.9	102	456	122	27
13b	26	39	1.5	178	312	116	37
14a	43	513	11.9	57	516	487	94
14b	40	275	6.9	80	480	367	76

TABLE 4 (Continued)
PARKING SPACE UTILIZATION
BANFF, SUMMER 1985

ZONE	PARKING SPACES	PARKERS 10 A.M. to 10 P.M.	AVERAGE # PARKERS PER SPACE	AVERAGE DURATION-MINUTES	SPACE HOURS - 10 A.M. - 10 P.M. AVAILABLE	UTILIZED	PER CENT UTILIZED
15a	30	341	11.4	61	360	347	96
15b	11	66	6.0	105	132	115	88
15c	62	428	6.9	102	744	728	98
15d	11	22	2.0	293	132	107	81
16	21	176	12.0	75	252	220	87
17	53	209	3.9	131	636	456	72
18	32	184	5.8	63	384	193	50
19	20	240	12.0	56	240	224	93
20	34	104	3.1	72	408	125	31
21	55	1093	19.9	30	660	547	83
22a	31	264	8.5	71	372	312	84
22b	23	440	19.1	28	276	205	74
23	35	88	2.5	143	420	210	50
24	16	81	5.1	93	192	126	65
25	8	31	3.9	50	96	26	27
	1342	9914	7.4	69	16104	11401	71

The large lot off Bear Street between Cariboo and Wolf (Zone 15c) showed a 98% utilization level due, in part, to motorists parking on walkways and in the aisles of the lot.

Relatively low utilization rates were observed along Bow Avenue, on Beaver Street north of the Firehall, on Wolf Street east of Banff Avenue and on Banff Avenue north of Elk Street.

8. PARKING SPACE DEMANDS

8.1 DEFINITIONS

As discussed in Section 2, the survey day for the parking study was selected with care so as to provide data that could be used for design criteria. It is neither practical nor prudent to consider the provision of convenient parking at all times for all motorists. Alternately, when the supply of parking spaces is inadequate, such that the shortage is chronic rather than occasional, steps should be taken to deal with the shortage.

For this study, the demand for parking spaces in a zone is defined as the average of the three highest accumulations observed during the survey. The definition of demand includes improper parking such as was noted where drivers parked on yellow curbs and in loading zones. It does not include instances of double parking (few were observed) or demand associated with drivers who dropped passengers for short-term business and then drove around the area while waiting to pick up the passengers.

Defining a practical supply of parking spaces in a zone must recognize that driver movements tend to be random in nature and parking spaces must remain empty, if only briefly, between a space being vacated and another driver finding the space. Thus the practical supply of parking spaces in a zone is set at a discount of the actual number of spaces in a zone.

For Banff, the practical capacities are defined as 90% of the actual number of curb spaces in a zone and 85% of the actual number of off-street spaces in lots. The lesser figure for off-street parking is on the basis that such parking is not generally so readily apparent or convenient as curb parking.

8.2 CURRENT

Table 5 lists the current supply and demand for parking on the basis of the definitions detailed previously. For

the study area as a whole, there was a net deficiency of 88 spaces or 7.5% on an effective capacity of 1173 spaces.

However, as shown in Table 5, there is a variety of surplusses and deficiencies scattered around the study area. Deficiencies were most prominent in:

- Zone 2 (Central Park)
- Zone 5c (Lot at former site of bus station)
- Zone 6 (Banff Avenue, Buffalo to Cariboo)
- Zone 7b (Lot behind Hudson Bay Store)
- Zone 10 (Cariboo, Banff Avenue to Lynx)
- Zone 21 (Lot at Safeway Store)

Surplusses were identified in:

- Zone 8 (Bow Avenue)
- Zone 13a (Beaver Street north of Cariboo)
- Zone 18 (Wolf Street east of Banff Avenue)
- Zone 20 (Banff Avenue north of Elk)

TABLE 5
PARKING SPACE SUPPLY/DEMAND ANALYSIS
BANFF, 1985

ZONE	CURB SPACES	OFF-STREET SPACES	EFFECTIVE CAPACITY	DEMAND	SURPLUS	(%)	DEFICIENCY	(%)
1	21		19	19	---	---		---
2		88	75	89	---	---	14	(19)
3	20		18	20	---	---	2	(11)
4	23		21	24	---	---	3	(14)
5a	46		39	44	---	---	5	(13)
5b		26	22	23	---	---	1	(5)
5c		62	53	67	---	---	14	(26)
5d		27	23	27	---	---	4	(17)
5e		50	43	52	---	---	9	(21)
6	52		47	63	---	---	16	(34)
7a	68		61	61	---	---	---	---
7b		90	77	93	---	---	16	(21)
7c		56	48	53	---	---	5	(10)
8	55		49	25	24	(49)	---	---
9	24		22	24	---	---	2	(9)
10	15		13	22	---	---	9	(69)
11	14		13	16	---	---	3	(23)
12	16		14	15	---	---	1	(7)
13a	38		34	28	6	(18)	---	---
13b		26	22	14	8	(36)	---	---
14a	43		39	45	---	---	6	(15)
14b		40	34	36	---	---	2	(6)

TABLE 5
PARKING SPACE SUPPLY/DEMAND ANALYSIS
BANFF, 1985

ZONE	CURB SPACES	OFF-STREET SPACES	EFFECTIVE CAPACITY	DEMAND	SURPLUS	(%)	DEFICIENCY	(%)
15a	30		27	33	---	---	6	(22)
15b		11	9	11	---	---	2	(22)
15c		62	53	63	---	---	10	(19)
15d		11	9	11	---	---	2	(22)
16	21		19	21	---	---	2	(11)
17		53	45	46	---	---	1	(2)
18	32		29	24	5	(17)	---	---
19	20		18	22	---	---	4	(22)
20	34		31	16	15	(48)	---	---
21		55	47	63	---	---	16	(34)
22a	31		28	28	---	---	---	---
22b		23	20	20	---	---	---	---
23	35		31	21	10	(32)	---	---
24	16		14	14	---	---	---	---
25	8		7	8	---	---	1	(14)
	662	680	1173	1261	68		156	

8.3 FUTURE

Any physical modifications to the parking system in Banff would logically recognize realistic forecasts of future levels of parking demand. Forecasts for the next few years of overall levels of travel and tourism in the Banff area would likely be influenced by such diverse and often volatile factors such as the levels of economic activity in the regional market of Alberta, by currency exchange rates and the price of petroleum, by terrorism in other tourist markets and by special events such as Expo '86 and the 1988 Winter Olympic Games.

Trends in visits to Banff in recent years have been erratic to the point where they cannot be used as likely indicators of future activity. After strong growth during the last half of the 1970s, activity levels in some sectors, such as camping and use of the Hot Springs, have been declining by an average of 3% or 4% per year during the first half of the 1980s.

For Banff, rather than make forecasts of future levels of parking demands, it is probably most appropriate to deal with current problems with the parking system.

Future additional needs for parking could be related to community plans as they are developed and to periodic repetitions of surveys of the type detailed in this analysis.

9. CLASSIFICATIONS OF PARKED VEHICLES

Observations carried out during the survey included the collection of data on the types of vehicles parked in the study area. Table 6 lists the numbers of parked vehicles by classification for each zone as well as totals for the study area as a whole.

Over 93% of the parked vehicles were in the classification of cars and pickup trucks that could utilize a normal sized parking space. This is a higher percentage of vehicles of this type than is found on the highways in Banff Park, but it should be noted that many trailers are left in campsites or drop-off areas and some parties travel with more than one vehicle.

Motorcycles continue to become more prominent in the summer traffic streams in the National Parks and accounted for 2.2% of the vehicles parked in the study area. It is common for a single motorcycle to occupy a parking space suitable for a full sized vehicle, resulting in inefficient use of the parking inventory.

Oversize vehicles, such as motorhomes and large pickup campers totalled 420 or 4.2% of the parked vehicles observed during the survey. There are no parking spaces specifically identified for these vehicles, with the result that the drivers experience considerable difficulty finding a place to park. They also cause considerable disruption to the parking supply because of their awkward attempts to use parking lots and the curb spaces.

Figure 5 is a map of the study area, showing the parking zones most frequented by oversize vehicles. From Figure 5 it can be seen that the oversize vehicles tend to park on the fringes of the business district and in the north end of the study area in the general area of the grocery store, liquor store and laundromat.

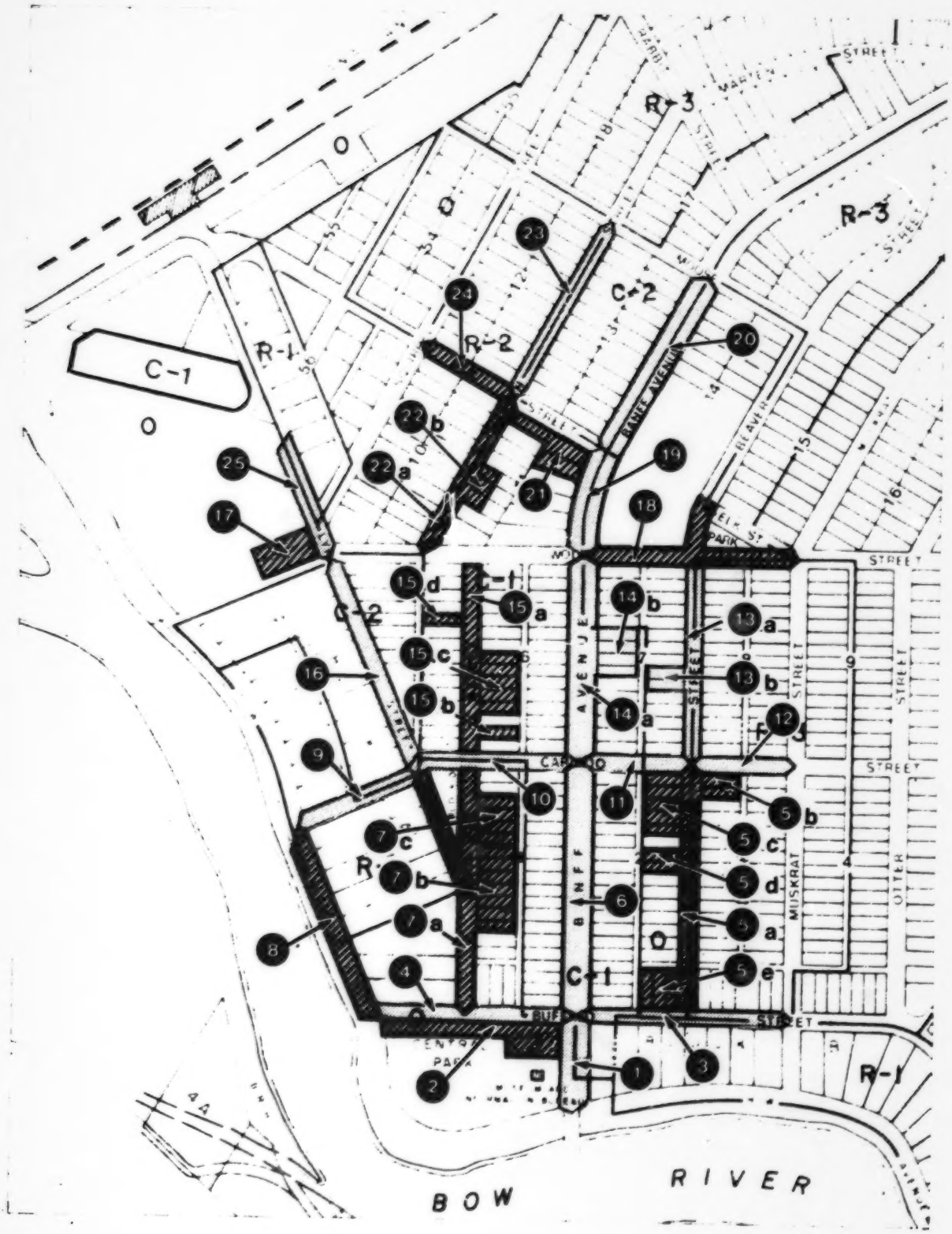
A total of 17 buses parked in the study area during the survey period. They tended to concentrate on the south end of Beaver Street and the north end of Marten Street.

TABLE 6
VEHICLE CLASSIFICATION ANALYSIS
BANFF, SUMMER 1985

ZONE	TOTAL NUMBER OF PARKERS	CARS AND PICKUPS	MOTOR-CYCLES	TRUCKS, MOTORHOMES, TRAILERS, LARGE VANS AND CAMPERS	BUSES
1	167	167	---	---	---
2	759	706	10	43	---
3	173	169	---	4	---
4	194	185	1	8	---
5	1176	1119	15	35	7
6	658	584	72*	2	---
7	1433	1364	22	47	---
8	114	86	1	27	---
9	131	116	4	11	---
10	200	186	11	3	---
11	159	151	2	6	---
12	84	76	---	7	1
13	111	106	---	5	---
14	788	751	32*	5	---
15	857	823	17	17	---
16	176	170	6	---	---
17	209	178	1	29	1
18	184	153	2	28	1
19	240	233	2*	5	---
20	104	89	2	13	---
21	1093	1029	13	51	---
22	704	658	5	41	---
23	88	70	1	11	6
24	81	59	---	21	1
25	31	30	---	1	---
TOTAL	9914 (100.0%)	9258 (93.4%)	219 (2.2%)	420 (4.2%)	17 (0.2%)

* ZONES 6, 14a AND 19 TYPICALLY HAD A TOTAL OF 6 to 8 ADDITIONAL MOTORCYCLES PARKED AT BICYCLE RACKS.

FIGURE 5
ZONES WHERE OVERSIZE VEHICLES PROMINENT
BANFF, SUMMER 1985



10. DISCUSSION AND OBSERVATIONS RE: MANAGEMENT AND DEVELOPMENT OF THE PARKING SYSTEM

10.1 GENERAL DISCUSSION

The parking system in a visitor-dominated centre such as Banff:

- is an important component in the overall functioning of the Town and,
- has the potential to enhance or detract from the visitor's experience.

The parking system should:

- compliment the land uses and visitor attractions,
- be easily understood, particularly by unfamiliar visitors,
- be easy to manage and maintain,
- function with a realistic minimum of regulations and,
- be developed to a scale that is appropriate to the levels of activity that prevail in Town.

Data presented in this analysis has shown that from early afternoon to late evening in the summer, there is a high and sustained level of parking activity. Nearly three-quarters (74%) of the parkers stay less than one hour and 94% stay less than three hours. It is important to note that those 6% of the parkers that stay over three hours consume 37% of the total hours of vehicle parking.

Parking deficiencies totalling 156 spaces and surplusses totalling 68 spaces were identified for a net shortage of 88 spaces. Areas where the supply is deficient are characterized by high levels of illegal parking and traffic congestion due, in part, to drivers looking for a convenient place to park.

The large numbers of oversize vehicles in Town are particularly problematic

because there are no parking spaces specifically identified or designed for their use. These oversize vehicles are present in sufficient numbers that their needs cannot be ignored in a well managed parking system.

10.2 GENERAL CRITERIA

An approach to meeting parking deficiencies in a head-on manner by simply building more parking lots has the disadvantages of:

- being very expensive and,
- creating the visual impression of a townscape dominated by parking lots.

Thus, areas for improving the management of the parking system should be fully explored before more parking spaces are created.

The levels of parking and traffic activity in Banff vary significantly, not only during the seasons of the year, but from day-to-day in the summer. As discussed in Chapter 2, the data presented in this report represent levels of activity found on a busy, warm and sunny summer day and a few days associated with extreme peaks of visitors have been ignored.

There are also a few days during the summer when, because of poor weather, visitors spend the day in Town, rather than visiting the attractions around the Parks. The point being, that a well designed and managed parking system for Banff must recognize that there will be a few days of the year when parking-related congestion will be present.

The regimentation associated with a highly regulated parking system that involves techniques such as metered parking will tend to be poorly respected in a tourist dominated town like Banff. Visitors engaged in leisure-time pursuits as alternatives to the disciplines of the home environment are generally not receptive to management of their time. Thus, management of the parking system in Banff should be as invisible as possible, with a minimum of regulations.

10.3 GENERAL SUGGESTIONS

10.3.1 TIME-LIMITED PARKING

In Chapter 8, the Demand Analysis, deficiencies of up to about 16 spaces were identified in several zones close to the centre of the business district. In Chapter 6, the Duration Analysis, it was identified that these same zones were used by significant numbers of long-term (over 3 hours) parkers. Examples are as follows:

ZONE	DEFICIENCY (SPACES)	LONG-TERM PARKERS
2	14	35
5c	14	52
5e	9	43
6	16	13
7b	16	67
10	9	13
15c	10	48

Zone 5c is the former site of the bus station at the corner of Beaver and Cariboo Streets. This parking lot has a capacity of 62 spaces and an identified deficiency of 14 spaces. There were, however, 52 long-term parkers using the lot during the survey day.

It is apparent that the deficiency in this lot and most other zones in the central area of Town would be relieved by the creation of time-limited parking. This would have the effect of relocating long-term parkers away to low demand areas and providing convenient needed spaces for short-term parkers.

10.3.2 PARKING FOR SPECIFIC TYPES OF VEHICLES

As detailed in Chapter 9, there are significant numbers of motorcycles parking in the central area of Town (219 were observed in regular parking spaces). This commonly results in inefficient use of the parking space inventory because a single motorcycle will typically occupy a space designed for a full-sized vehicle.

This inefficient use of parking spaces could be relieved by the designation of a few zones specifically identified for motorcycle parking. For example, up to 8 motorcycles could park in the length of 2 normal curb spaces.

The requirement to provide parking spaces for oversize vehicles in the central area of Town is one of the most pressing problems to be dealt with in the management of the parking system in Banff. As noted in Table 6, oversize vehicles account for about 4.2% of the parkers. In a total demand for 1261 spaces, this suggests a need for a minimum of 50 spaces for oversize vehicles.

This need could be met by the designation, and redesign where appropriate, of 3 cells of 20 spaces or so in off-street lots around the core area.

In order that parking spaces designated for motorcycles and oversize vehicles function as intended, it would be appropriate to provide information sheets to the drivers of these vehicles at the Park entry points when Park stickers are being purchased.

10.3.3 CREATION OF NEW PARKING SPACES

The general area of the block bounded by Banff Avenue, Elk, Marten and Wolf Streets is a high parking demand area associated with retail services such as groceries, liquor and a laundromat. There is a present shortage of about 20 spaces, which will be sharply increased by the loss of the lot at the site of the new hospital where there was a demand for 46 spaces.

Time limited parking in this general area would result in only modest relief because there were only 45 long-term parkers in Zones 19, 21 and 22. There is an additional complication in that time limited parking is not practical along Marten Street and other residential areas.

Thus, in this area of Town, the creation of additional general purpose public parking is the only realistic approach to meeting the problems. New parking spaces should recognize the prominence of oversize vehicles in this area of Town, many of which used to park at the hospital site and several years ago, on the school grounds.